11. A dog similar to a cat?

Description

After determining the area of computer science that is interesting for you, you decide to apply for Artificial Intelligence to university. The task on the first year midterm exam is to determine which pair of 2 images from N given images are most similar to one another. Since you are not yet in university, you will solve a simplified version of this task - the pictures are black-and-white, and represented as a single line of ‘0’ and ‘1’, where ‘0’ shows that the pixel in the image is white, and ‘1’ is, respectively, black. For you to perceive this task with ease, just imagine that you are in college right now - there will be no hints, same as there will be no hints on how to do it in this task.

Input

First input, the integer `n`, is as usual shows the amount of analysis sessions you will need to perform. For each analysis session, the first numbers are the amount of images you will need to compare (represented as an integer `amt`) and an integer `l` - in case you need it - which shows the length of each row of the image. In other words, the first `l` characters of a given string is the first row of pixels in the image, words starting from `l+1` to `2l` are the second row, etc. The next `amt` lines each show the sequence of ‘0's and ‘1’s - this is how the image is being represented. Each “image line” starts with the capital letter that shows the “name” of the image. For each set of lines, you need to output the pair of `2` letters, representing the “names” of the strings. All images have the same resolution. In other words, each of the image string lengths will be the same.

Output

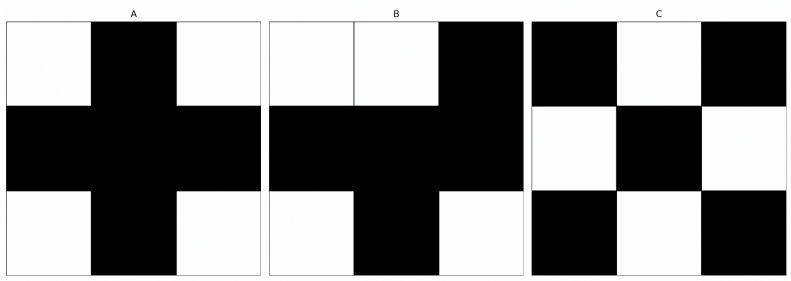
Your goal is to output a single number, representing all possible distinct ways the mathematician can get out from the board.

Constraints

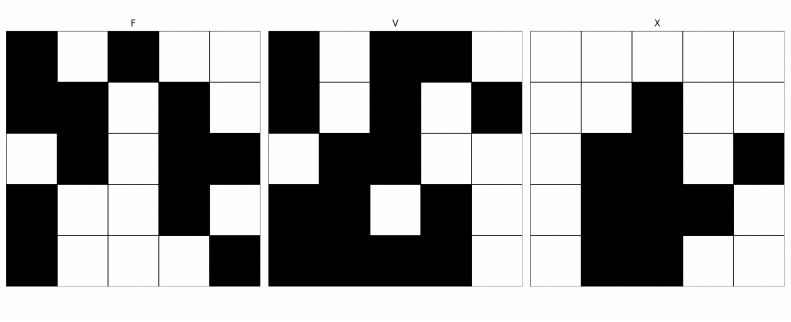
$1 \leqslant n \leqslant 2^{15}$
$1 \leqslant amt \leqslant 2^{5}$
$1 \leqslant l \leqslant 2^{5}$

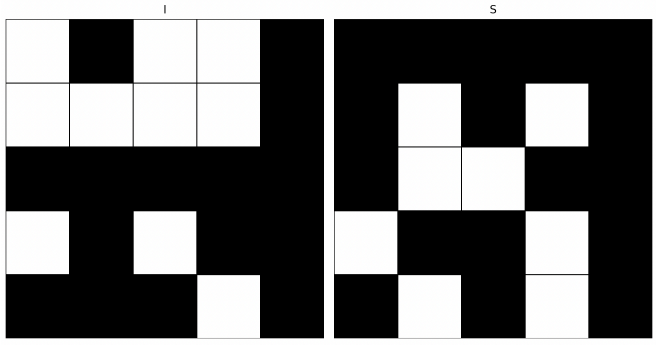
Example Input

```
2
3 3
A010111010
B001111010
C101010101
```




```
5 5
F10100110100101111001010001
V10110101010110011010111110
X00000001000110101110011100
I01001000011111110101111101
S11111101011001101101101101
```





Example Output

```
AB
IS
```